

PS 8510.01 FACTORY COSTING PROCEDURES



# Program Statement

OPI: FPI  
NUMBER: 8510.01  
DATE: 11/21/97  
SUBJECT: Factory Costing  
Procedures

1. PURPOSE AND SCOPE. To establish costing procedures for the Management Control System (MCS) Shop Floor Control Module. This Program Statement replaces the cost accounting manual for those factories that have implemented Phase III of MCS. The MCS Shop Floor Control Module uses a cost system composed of planned costs of material and overhead. The planned costs are developed using engineering standards as a basis and adjusted as conditions warrant. It is a system where actual costs are promptly compared with planned costs at the completion of a job to determine variances that can be analyzed for production efficiency.

The MCS Shop Floor Control Module is designed to aid in quoting, planning, costing, scheduling and controlling job orders. It is integrated with the Purchasing, Inventory, Order Entry, General Ledger and Material Requirements Planning (MRP) Modules.

The MCS Shop Floor Control Module consists of three major sections:

- # Job Definition
- # Estimating
- # Work Center Capacity and Dispatching

Job Definition contains the shop floor control aspects of the system as well as job maintenance, job costing, job scheduling, and capacity planning generation.

Estimating contains a quotation maintenance system, an estimated job facility, and a worksheet for performing analysis of profit margins, unit costs, pricing, and break-even quantities.

Work Center Capacity and Dispatching displays and reports work center dispatch lists. In addition, visual displays of schedules are found in this section.

This system provides Federal Prison Industries (FPI) management with additional tools to analyze and monitor the cost and performance of job orders by using the MCS Shop Floor Control Module.

2. PROGRAM OBJECTIVES. The expected results of this program are:

a. Costs will be accurately charged to the appropriate products.

b. Inventories will be valued realistically and in accordance with generally accepted accounting principles.

c. Management will be able to determine product profit measurement for effective decision-making in areas of pricing, product expansion or deletion, and planning and control of operations.

3. DIRECTIVES AFFECTED

PS 8000.01 UNICOR Corporate Policies and Procedures  
(5/13/81)

PS 8340.03 Quality Assurance Program UNICOR (9/30/94)

4. STANDARDS REFERENCED

a. American Correctional Association 3rd Edition Standards for Adult Correctional Institutions: 3-4406

b. American Correctional Association 3rd Edition Standards for Adult Local Detention Facilities: 3-ALDF-5A-17

c. American Correctional Association 2nd Edition Standards for Administration of Correctional Agencies: None

5. DEFINITIONS

a. Department. (Defined by Product Support Center.) A factory entity organized or located to perform a particular function or to produce a particular product. Consideration shall

be given to management's desire to control activity when establishing departments for a given industry or factory. Examples of departments are: press, packaging, paint line, physical fitness shorts, or mail bags.

b. Work Center. (Defined by Product Support Center.) Work Centers are specific functions or machines within a department. Consideration shall be given to the level of control management wishes to establish over the production process when establishing work centers for a particular factory.

c. Cost Center. (Defined by Financial Management Branch (FMB).) The unit of activity for which costs are accumulated. Cost centers may encompass one or more departments and are established for the purpose of cost control or product costing at the level management determines to be justifiable (cost vs. benefit). Accumulated expenses for each cost center are reported on the FPI Form 4 (Summary of Expenses).

d. Overhead Expenses. Those costs that are not easily identified to specific products or services. They are classified as either Production (Variable) Overhead or Support (Fixed) Overhead.

(1) Production (Variable) Overhead are those costs incurred as a direct result of a production operation and can be easily identified to a department's production activities. They include costs associated with keeping production lines operating, such as foremen and inmate wages, supplies, and indirect material.

(2) Support (Fixed) Overhead are those costs resulting from activities performed in support departments. These costs are not clearly identified to a production operation. Support departments include the Business Office, Material Management, and Quality Assurance.

6. DEVELOPING OVERHEAD RATES. Overhead application rates shall be established for variable and fixed overhead costs by product family and/or departments. These rates shall be applied to products based on the standard hours established in the item standard routing.

a. Establishing Rates. Three elements shall be used to determine overhead rates.

(1) Factory Capacity. The factory capacity is an estimated production level the Factory Manager and the Program Manager develop in conjunction with the Product Support Center. The capacities shall not be lower than the product family capacities negotiated in the Memorandum of Agreement (MOA) or in the FPI Operating Plan. The current production level may be considered in determining the factory capacity. Once capacity has been determined for each product family, the yearly total units to be produced shall be calculated for each product family.

(2) Standard Hours. Work Measurement Coordinators are responsible for maintaining approved work measurement studies. Approved work measurement studies establish the standard hours required to produce a given product. FMB reviews the standard hours a factory submitted by comparing them with the factory's utilization ratio. The utilization ratio of labor-based factories is determined by comparing the standard hours required to perform at the MOA capacity with the direct inmate hours available.

This ratio is normally within the 80% to 90% range. If not, further analysis is appropriate to explain the variance or correct any errors. In machine based factories, this comparison can only be used to determine if sufficient labor is available to perform at the agreed capacity. The standard hours, in conjunction with material requirements on the Bill of Material (BOM), comprise the item standard routing.

(3) Overhead Expenses. The variable overhead expenses must be categorized by a cost center, such as cut, sew, and pack. The support expense cost centers include the Business Office, Material Management, Quality, Warehouse, Maintenance, and Factory Office.

b. Calculating Fixed and Variable Application Rates

(1) Determine the average standard routing time for the product families. This is calculated from the "Item Standard Routing". By adding each operation's time, the total standard

time is determined for that product. The total standard time is determined by adding each operation's time for a particular product. Combine products within a particular product family and average the time.

Example: Standard time to produce three types of gloves.

Glove Type I	-	0.17 hrs.
Glove Type II	-	0.19 hrs.
Glove Type III	-	0.20 hrs.
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		0.56 hrs. ÷ 3 = 0.1867

The average standard time is 0.1867 hrs.

(2) Multiply the product family capacity and the average standard hours to determine the total standard hours needed to produce the products for the year.

Example: The capacity for the three types of gloves.

Glove Type I	-	100,000
Glove Type II	-	50,000
Glove Type III	-	300,000
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Total		450,000 x 0.1867 = 84,015 hrs.
		(Total Standard Hours)

(3) The Variable Rate is calculated by dividing the total product family cost center budget by the total standard hours per product family. Direct labor costs are part of the variable overhead expenses.

Example: Total variable overhead expense is \$800,000.

\$800,000 divided by 84,015 hours is \$9.52 per standard hour.  
(Variable Rate)  
(If applicable, individual cost center rates may be established.)

(4) The Fixed Rate is calculated by dividing the total support budget by the total standard hours.

Example: Total Fixed expense is \$100,000.

\$100,000 divided by 84,015 hours is \$1.19 per standard hour.  
(Fixed Rate)

(5) Overhead rates are maintained in the department parameters of the Shop Floor Control Module.

c. Review and Analysis of Application Rates. While initial application rates are established annually, a periodic review of the rates for appropriateness shall be performed. The Business Manager and/or Plant Controller shall conduct this review at least quarterly.

Monthly analysis of variances in applied overhead (over/under) provides useful data to determine the appropriateness of application rates. Factors to examine when analyzing over/under applied overhead are:

- (1) actual production vs. capacity,
- (2) actual overhead cost vs. budget,
- (3) additions/deletions of product lines, and
- (4) changes in the production process.

Under-utilization of production capacity and short term expansion of capacity should not be considered as providing a basis for adjusting application rates. Cost variances from the budget must be reviewed in detail and a determination made as to the cause and long term effect prior to substantiating a request for rate changes.

Annual application rates must be submitted to the FMB by July 31 of each year. The approved MOA provides support for application rate requirements. The FPI Controller shall approve all application rates and changes, and notify field offices and various corporate support branches (Program Management and the Product Support Center) via memorandum.

## 7. FIELD COST MANAGEMENT PROCEDURES

a. The Factory Manager is responsible for initiating new jobs in the Shop Floor Control Module. Jobs are normally created by confirming a plan generated by MRP and releasing the job. This

data is retained in the system, so it is not necessary to print job headers. Review of appropriateness will be accomplished by reviewing MRP data. The approval by the Associate Warden/SOI of jobs created through MRP is not required.

b. Materials are issued to jobs based on the pick list generated and signed by the factory foreman. The Factory Manager shall also initial any changes in quantity or substitute items. The Warehouse shall sign and file the pick list. The factory foreman is responsible for insuring that the quantities requested were in fact issued.

c. As units on a job are completed and moved from operation to operation, the factory foreman shall add and post job transactions. Adding and posting these transactions will update the job record for the job run hours and applied overhead. This action will also generate an entry for applied overhead in the Inventory Distribution Journal. Completion of units at the final operation also results in updating sub-assembly or finished goods records. All sub-assembly and finished goods costs shall be calculated at the planned cost of the job. Variances between actual and planned costs remain in Work-In-Process until the job is corrected and/or closed. Overhead application is based upon standard hours. Tracking and posting of actual direct hours to individual jobs are not required.

d. The Factory Manager shall perform job closure in MCS within 48 hours of completion of the production process. Special care must be taken at month-end to insure that all jobs which have completed production in the last few days are reviewed and closed within that month. Closure is accomplished by updating the job status in the system and changing it from (R)leased to (C)omplete. Before closure is accomplished, the Factory Manager shall review the Job Cost Variance Report and accomplish any required corrections and usage explanation. The Business Manager/Plant Controller shall explain any material and overhead cost variances. The Factory Manager shall explain any variances in material usage.

e. The Business Manager or designated accountant shall reconcile the general ledger account 14050 (WIP Inventory) weekly and the WIP Valuation Report monthly. The Business Manager and



Factory Manager shall review the WIP Valuation Report at month-end. The Factory Manager shall analyze the ending WIP values and identify possible problems with jobs.

f. The Factory Manager and Business Manager shall review the Job Cost Variance Report upon completion of a job. If variances for materials and/or overhead are within +/-10% of planned cost, no further action is required. If variances are not within +/-10% of planned cost, the following additional reports provide useful data to develop and support variance explanations:

(1) The Job Operation Detail Status Report provides material usage variances as well as standard hour recording variances.

(2) The Job Cost Detail Status Report provides material cost variances.

The Factory Manager and Business Manager/Plant Controller shall insure that completed jobs are reviewed. The analysis of these reviews shall be recorded in the job text for all jobs with variances of +/-10% in either material or overhead. Detailed analysis is required when jobs exceed the sales threshold established for each product group as listed:

Graphics & Services	\$ 2,500
Electronic & Plastics	10,000
Optics	1,000
Metals	10,000
Brush/Broom	2,500
Cut & Sew	5,000
Furniture	5,000

If variances are recurring because of incorrect Bill of Material or routings, the incorrect Bills of Material or routing shall be corrected and the Product Support Center notified.

g. The Job Exception Report shall be printed monthly for all jobs closed during the month and retained in the monthly work papers. This report provides management with the capacity to

review data on all closed jobs. The report is printed at the summary level for "Closed" jobs during the period. When printed for jobs with a status of "Released", it provides management with an overview of active jobs and helps identify potential troubles on jobs. The Business Manager and Factory Manager shall certify all variances greater than +/-10% as reviewed and the results included in the text of the job in MCS. The Job Exception Report shall be retained in the monthly working papers for review.

h. The Item Cost by Completed Job Report shall be reviewed annually for each finished good. This report provides a listing of all completed jobs and their costs for the period of time selected. Management shall review all completed jobs for the previous 12 month period. Management shall use this review to identify trends of increasing or decreasing costs and make recommendations regarding Unit Cost Estimates and pricing to the appropriate program manager through memorandum.

8. SHOP FLOOR CONTROL ACCOUNT NUMBERS. The following account numbers (or their equivalent under the current Chart of Accounts) and brief descriptions shall be included in the general ledger in order to adequately classify transactions under Shop Floor Control.

- a. 14050 - WIP Inventory. This account is for all open jobs in process.
- b. 14060 - WIP Sub-assemblies.
- c. 15060 - Allowance for Defective Finished Goods.
- d. 53030 - Planned Cost Variance. The difference in actual verses planned cost is reported in this account.
- e. 54010 - Rework Cost for Customer Returns
- f. 54020 - Rework Cost during Production
- g. 61154 - Direct Inmate Labor Costs. Indirect inmate labor costs shall be classified in the 61151 account.
- h. 62010 - Production Applied Expenses
- i. 62020 - Support Applied Expenses

9. RETENTION OF SHOP FLOOR CONTROL REPORTS. A job history shall be retained in MCS for three years from the last Program Review. The following reports shall be included at a minimum:

- a. Pick Lists. Retain hard copies for three months.  
(Immediate access in MCS for 36 months.)
- b. Job Order Header. (Immediate access in MCS for 36 months.)
- c. Job Cost Variance Report. (Immediate access in MCS for 36 months.)
- d. WIP Valuation. The monthly WIP Valuation shall be reconciled to the general ledger and maintained in the monthly close-out folder for three years.
- e. Job Exception Report. The monthly Job Exception Report shall be maintained in the monthly close-out folder for three years.

10. SCRAP AND DEFECTIVE WORK. The control and accountability of defective work is an important element of the production planning and control system. Most manufacturing processes generate some bad units along with acceptable units as an unavoidable or inherent result of production. The reason for these losses shall be identified in accordance with the Quality Assurance Manual and every effort made to keep the cost of defective work as low as practicable through improvements in operating procedures, changes in machine design, use of different material, etc.

Management shall monitor and control the occurrence of defective work within predetermined limits. Rework of defective work shall be accomplished only when rework is more economically advantageous than salvage. When the costs of rework or replacement of the defective work are expected to be significant as determined in the Quality Assurance Manual, the Quality Assurance Manager shall initiate a Defective Work/Scrap Report (FPI Form 31). The definition of defective work or abnormal scrap can vary between products and factories and identifying it is a matter of judgment. Materiality is the key factor. The Quality Assurance Manager shall develop guidelines for each product line in a factory defining the thresholds at which a Defective Work/Scrap Report would be initiated.

When using the MCS Shop Floor Control system, capturing rework costs requires preparation of manual journal entries for the various circumstances.

a. While a job is in production, capturing rework cost is accomplished by issuing overages of required material to the job. These additional material costs shall be reflected on the Job Cost Variance Report. If a FPI Form 31 is not generated for the additional material, the overage in material cost shall be charged to the Planned Cost Variance Account, 53030.

b. If the rework cost is significant or abnormal as defined by the Quality Assurance Manager and the job remains open, the abnormal cost must be reported on the FPI Form 31. The recording of abnormal cost in the MCS Shop Floor Control Module is as follows:

(1) For the additional rework material, issue overage in material with the pick list.

(2) For the additional labor hours, generate a job transaction with extra hours used and move "0" units in the Job Transactions.

To capture the cost of rework, the accountant shall generate a manual journal entry on the last day of each month crediting account 53030 and debiting account 54020 for the cost of the rework. This journal entry shall reconcile to the total of all FPI Form 31s for each month.

c. When rework is significant and the job has been closed, the abnormal cost must be reported on the FPI Form 31. To capture the abnormal cost, the accountant shall write a manual journal

entry debiting account 54020 and crediting account 53030 based on summation of FPI Form 31s. A manual journal entry is the only way to capture the abnormal cost of reworks in MCS.

11. DEFECTIVE WORK RETURNED FROM CUSTOMER. The Quality Assurance and Factory Manager shall inspect defective finished goods the customer returned upon receipt. The Quality Assurance

Manager shall initiate a FPI Form 31 for all significant rework costs. It shall include material, labor, and overhead costs that are required for the rework. The FPI Form 31 shall be prepared within two working days of the receipt of defective goods.

The Business Office shall process a credit return in the Order Entry Module for all items returned. If a credit invoice is required, the accountant shall issue a credit and return the damaged finished goods to stock via the MCS Order Entry Module. The damaged finished goods shall be returned at current unit cost. The returned items shall be placed in a defective stock location. If the customer retains the damaged finished goods, the accountant shall enter a credit return with no return to stock.

a. The following procedures shall be followed to establish a job to repair/rework the damaged finished goods:

(1) Create a rework job by adding a job in the MCS Job Definition.

(2) Add a Bill of Materials (BOM) and Routing for the work to be accomplished. It is permissible to copy the standard item BOM and routing and then update it to show only the material required to accomplish the rework. Add an additional operation for shipping and also update the run time for the job. Appropriate routing times for each operation shall be included. The additional operation will have -0- standard hours.

(3) Issue Material through the generation of a Pick List.

(4) Process the Job Transaction.

(5) Close the job at the shipping operation and do not move the finished goods to the warehouse in the Job Definition.

b. Journal entry procedures for rework cost of damaged goods:

(1) To record receipt of returned goods. System generated from Order Entry Module.

DR: 15010 - Finished Goods Manufactured  
CR: 51000 - Cost of Sales - Other Govt Agencies

(2) To record estimated cost of rework. Manual Journal 19A.

DR: 54010 - Cost of Warranty Replacement/Repair  
CR: 15060 - Allowance for Defective Fin. Goods

(3) To record rework job closure. System generated from Job Definition.

DR: 53030 - Planned Cost Variation  
CR: 14050 - Work in Process Inventory (MCS)

(4) To record final journal entries to capture rework cost. Manual Journal 19B to clear the allowance account and adjust the rework account for any differences between actual and estimated cost.

DR: 54010 - Cost of Warranty Replacement/Repair  
15060 - Allowance for Defective Fin. Goods  
CR: 53030 - Planned Cost Variation  
54010 - Cost of Warranty Replacement/Repair

12. WORK IN PROCESS INVENTORY. Individual locations shall conduct a physical inventory of work in process in September of each year. The Business Manager shall use Inventory Tags (FPI Form 64) to identify the job number, item number, quantity, and operation number and prepare a manual journal entry for the overage/shortage to account 53020 prior to September 29th. The WIP Valuation Report shall be adjusted by this manual journal entry in order to reconcile to the general ledger at year-end. The accountant shall reverse this manual journal entry in October of the new fiscal year so that the WIP Valuation Report can be reconciled to the Account 14050.

13. WORK IN PROCESS INVENTORY VALUATION

a. The accountant shall review the WIP Valuation Report monthly. Jobs with material charges that have been in process for longer than 120 days must be inventoried. The accountant

shall provide a listing of these jobs to the Factory Manager who shall prepare the necessary inventory reports and forward them to the Business Manager. The ending balance shall not exceed 95% of the selling price for finished goods. If the costs exceed 95% and are not a result of excess material which will be returned to raw materials inventory, a manual journal entry shall be processed to record the write down amount by debiting account 53010 and crediting account 14050. The manual entry is reversed in the following month. The journal entries and the reversals shall continue each month until the job is closed.

b. The accountant shall review the Item Cost by Product Code Report each month for all items with product code "FG" to ensure that all finished good items are valued at the lower of cost or 95% of selling price and make needed adjustments each month as follows:

Caution: The accountant shall accomplish these steps consecutively. The flag should be defaulted to "no" at all times.

- (1) Update and change negative flag from "no" to "yes".
- (2) Process miscellaneous receipt for -1 unit @ total dollar adjusted amount.
- (3) Process miscellaneous receipt for +1 unit @ "0" dollar amount.
- (4) Update and change flag back to "no".

14. SUBASSEMBLIES. Subassemblies are defined as a manufactured component part of a product manufactured by FPI. The Factory Manager shall request an item number from the Product Support Center for all subassemblies. A job shall be created to produce subassemblies. The completed subassemblies shall be carried at a stock location within the factory and classified in account 14060.

15. SECONDS. Seconds are finished items that are sold at a reduced price because of manufacturing defects. The Factory Manager shall request an item number for seconds. Items identified as seconds shall be moved from the regular finished goods item number to the seconds item number through "miscellaneous issues" and "miscellaneous receipts." The difference in cost shall be debited to account 53010 automatically through "net miscellaneous issues and receipts".

16. CORRECTING JOBS DURING PRODUCTION

a. If a correction is required as a result of an incorrect movement of goods through the system, the Factory Manager or designee shall follow these steps and coordinate the action with the Warehouse Supervisor or the accountant as appropriate:

(1) Select (J)ob Definition from the menu.

(2) Select (J)ob Transactions from the menu.

(3) Add a transaction where the incorrect transaction originated. If too few items were moved, add additional units to move. If too many items were moved, enter a negative quantity to move. For example, if 15 items should have been moved but only 10 actually were, add five additional units to move.

b. If corrections are required for material issues, the warehouse foreman shall follow these steps:

(1) Excess materials shall be returned to the warehouse by accomplishing a negative issue on a pick list.

(2) The Factory Manager shall annotate material substitutions to the job on the pick list in MCS. When issuing, the Warehouse Supervisor shall add the material to the operation.

17. TRANSFER OF MATERIAL FROM ONE JOB TO ANOTHER. When raw materials are transferred from job to job, the factory foreman shall generate a pick list on the affected jobs. The pick lists shall be forwarded to the warehouse foreman within the same day of the transfer. The warehouse foreman shall accomplish a negative material issue back to the warehouse and a positive issue from warehouse to the receiving job. The warehouse foreman shall complete these two transactions within the same day of the physical transfer of the raw materials.

Note: All material transfers will flow through the Inventory Module and any slight differences in the unit costs that result shall be charged to account 53030 by the system.

18. RETURNING EXCESS OR UNUSED RAW MATERIALS TO THE WAREHOUSE. When raw materials are returned to the warehouse, a pick list is



generated to document the return. This is accomplished through a

negative material issue from the job to the warehouse stock location. The warehouse foreman shall process this transaction on the same day of the physical transfer of the raw materials.

19. SHOP STOCK. Shop stock is used when the nature, size, or type of raw material prevents a determination of the exact quantity required for a job or when the material must be processed in some manner prior to being assigned or distributed to an individual job.

Shop Stock shall be under the Factory Manager's control and accountability. Shop Stock shall be assigned the stock location in the Inventory Module of Shop Stock (13020) and physically inventoried monthly by the Factory Manager.

The Factory Manager/designee shall perform issues to jobs from shop stock.

20. SPECIAL TOOLING. Special tooling is defined as special tools, dies, jigs, or fixtures, and such equipment purchased or manufactured for a particular customer order. If a customer order requires special tools, dies, jigs, or fixtures, and such equipment is purchased or manufactured, these costs shall be included in the Bill Of Material. Receipt of such items can be processed as "Combined purchase order receipt/(J)ob Issue". If it is to be used on future jobs, the cost shall be expended or capitalized if it meets the capitalization criteria.

21. EXTERNAL PRODUCTION WORK. External production work occurs when the factory does not have the resources to handle certain phases of the production process. The raw material or work in process inventories are sent out to a vendor for external production work. This inventory shall remain as an asset to the corporation and designated with a stock location of "at Finishers".

When goods are received from the finishers against a purchase order, the receipt shall be accomplished as "combined purchase order receipt: (J)ob Issue". Material shall be received and issued to the job at the same time. The process is as follows:

- # Establish an outside work center for the finishers.
- # Add the operations to job routing.
- # Add material to the Bill of Material at the operation

referenced in the purchase order.

# When the items are received, enter (7) Purchase Order Receiving and (J)ob Issue at the same time.

22. RESEARCH AND DEVELOPMENT. All major and/or significant R&D projects shall follow Product Support Center guidelines.

If applicable, the project representative shall collect all expenses associated with R&D projects by identifiable project informally.

23. MINIMUM BUY. Minimum buys occur when a vendor requires FPI to purchase material quantities in excess of FPI's current needs. When no recurring need exists for this material, the cost of the minimum buy (all material to be purchased) shall be included in the pricing quote to the customer. Upon completion of the production process, all remaining material from the minimum buy is the customer's property. Factory staff shall inventory the material, segregate it in a secured area, and request disposition instructions from the customer.

a. When the customer requests the material and provides shipping instructions, the prepackaged items shall be shipped in accordance with the customer's instructions and the memorandum shipping order (FPI Form 8) prepared to document the shipment.

b. When the customer requests that FPI retain the material for use on future orders from the customer, the materials shall be left packaged and returned to the warehouse for storage. A stock location shall be created for that customer and the materials placed in inventory at no cost. The stock location shall be "non-nettable" so that the material is not available for orders other than for this customer.

c. When the customer does not want the material and allows FPI to retain it without restrictions, the materials may be returned to the warehouse at no cost. It will be accounted for in quantity only and placed in a "nettable" stock location for use on other orders.

d. When the customer does not want the material and advises FPI to dispose of it, the material shall be disposed of in accordance with the Federal Property Management Regulations.

4. INFORMATION. For comments and questions, contact the respective Field Financial Administrator.

/s/

Kathleen M. Hawk  
Director